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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of
Lloyd G. Burrell et al.

Serial No.: 09/805,027

Group Art Unit: 2822

Filed: March 12, 2001

Examiner: M. Lewis

For: COPPER TO ALUMINUM INTERLAYER INTERCONNECT USING
STUD AND VIA LINER

BOX "AF"
RESPONSE UNDER 37 C.F.R. § 1.116

---EXPEDITE PROCEDURE---

Commissioner for Patents
United States Patent and Trademark Office
P. O. Box 1450
Alexandria, Virginia 22313-1450

EXAMINING GROUP 2822

REQUEST FOR RECONSIDERATION UNDER 37 C. F. R. §1.116

Sir:

In response to the Office Action mailed April
2003, please reconsider the above-identified
application in view of the following remarks.

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REMARKS

Claims 1 - 3, 5 - 7 and 9 - 16 remain active in
this application. Claims 4 and 8 have previously been
canceled. Claims 11 - 16 have been withdrawn from
consideration as being non-elected, without traverse,
in response to a requirement for restriction. No new
matter has been introduced into the application.

Claims 1 and 5 have been rejected under 35 U.S.C.
§102 as being anticipated by Colgan et al.; claims 2
and 6 have been rejected under 35 U.S.C. §103 as being
unpatentable over Colgan et al. and Barth et al.;
Claims 3 and 7 have been rejected under 35 U.S.C. §103
as being unpatentable over Colgan et al. in view of
Tobben et al.; and claims 9 and 10 have been rejected
under 35 U.S.C. §103 as being unpatentable over Colgan

et al. in view of Jain et al. These grounds of rejection are respectfully traversed for the reasons of record since the references relied upon and Colgan et al., in particular, do not contain the teachings or suggestions the Examiner attributes to them.

The Examiner relies on the apparent acknowledgment in Colgan et al at column 1 that tungsten studs are known rather than the teaching of use of a copper and aluminum alloy for studs to which Colgan et al. is principally directed. However, No teaching of a tungsten stud *in combination with a liner* is seen in Colgan et al. and the passage of Colgan et al. at column 4, lines 23 -27 relied upon by the Examiner for such a teaching is devoid of any reference to a liner structure which, in any event, would not serve the same purpose in regard to a CuAl alloy stud as in the invention, as claimed (e.g. to prevent attack by tungsten processing materials). Therefore, Colgan et al. does not, in fact, anticipate any claim in the application.

Barth et al. is applied for teaching of particular liner materials. However, Barth et al. is directed to the formation of capacitor plates containing copper and thus does not recognize or address the problem addressed by the invention of preventing damage to conductors due to tungsten processing materials and does not address or provide the meritorious effect of allowing studs to be fabricated at smaller sizes by use of tungsten rather than copper and/or aluminum. Therefore Barth et al. does not provide evidence of a level of ordinary skill in the art which would support a conclusion of obviousness of providing a liner in Colgan et al. in combination with a tungsten stud or motivation for such a modification since it does not lead to an expectation of success as to either of the meritorious effects of the invention.

Similarly, the passage of Tobben et al. relied

upon by the Examiner discusses liner materials in a layered conductor structure wherein the principal conductor material in the "sandwich" is aluminum. Therefore, Tobben et al. fails to supplement Colgan et al. for the same reasons discussed above in regard to Barth et al.

Jain et al. is cited for the limited purpose of teaching a covering layer. No text is seen at column 5, lines 25 - 28, much less any teaching regarding a covering layer and no reference numeral 50 is seen. In any case, no teaching or suggestion is seen in Jain et al. which would supplement Colgan et al. at the points of deficiency of Colgan et al. to answer the claim recitations as discussed above.

Accordingly, it is seen that the Examiner has not, in fact, made a *prima facie* demonstration of anticipation or obviousness of any claim in the application and it is apparent that no such demonstration can be made on the basis of the prior art relied upon. The stated grounds of rejection are clearly in error since the references relied upon do not contain the teachings or suggestions which the Examiner attributes to them. Therefore, reconsideration and withdrawal of the rejections of record is respectfully requested.

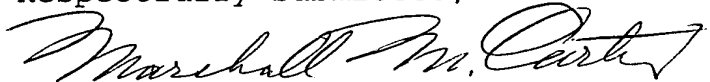
By the same token, it is respectfully submitted that the finality of the present action is premature. Finality of an action cannot be proper where the propriety of rejections made has not been *prima facie* demonstrated. Therefore, reconsideration and withdrawal of the finality of the present office action is also respectfully requested.

Further, it is noted that the present action is silent as to any ground of rejection of claims 4 and 8 while no indication of allowability has been made. It is also respectfully submitted that finality of an incomplete action is improper and should be withdrawn.

Since all rejections, objections and requirements contained in the outstanding official action have been fully answered and shown to be in error and/or inapplicable to the present claims, it is respectfully submitted that reconsideration is now in order under the provisions of 37 C.F.R. §1.111(b) and such reconsideration is respectfully requested. Upon reconsideration, it is also respectfully submitted that this application is in condition for allowance and such action is therefore respectfully requested.

If an extension of time is required for this response to be considered as being timely filed, a conditional petition is hereby made for such extension of time. Please charge any deficiencies in fees and credit any overpayment of fees to Deposit Account No. 09-0458 of International Business Machines Corporation (E. Fishkill).

Respectfully submitted,



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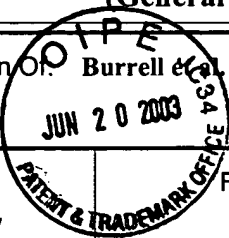
PATENT TRADEMARK OFFICE

AF / 2822

TRANSMITTAL LETTER
(General - Patent Pending)

Docket No.
00750429AA

In Re Application Of: Burrell et al.



Serial No.
09/805,027

Filing Date
3/12/01

Examiner
M. Lewis

Group Art Unit
2822

Title: Copper to Aluminum Interlayer Interconnect Using Stud and Via Liner

TO THE COMMISSIONER FOR PATENTS:

Transmitted herewith is:

Request for Reconsideration Under 37 CFR 1.116
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BOX "AF"
RESPONSE UNDER 37 C.F.R. § 1.116
---EXPEDITE PROCEDURE---
EXAMINING GROUP 2822

in the above identified application.

- ☒ No additional fee is required.
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Dated: June 20, 2003

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703/787-9400

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